

REMARKS

The Office Action of November 26, 2010 was received and its contents carefully reviewed. Claims 13-19 are currently pending, of which claims 16-17 are withdrawn from further consideration pursuant to 37 C.F.R. 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Reconsideration and allowance of the instant application is requested for the reasons advanced in detail below.

The Terminal Disclaimer filed on November 1, 2010 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10/584,266 was reviewed and found unacceptable by the Examiner. In view of the above, a revised Terminal Disclaimer is provided to overcome the Examiner's objection. As a result, the provisional refusal based on co-pending Application No. 10/584,266 should be overcome.

Claims 13-15 and 18-19 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Hamamoto et al. (JP 2002-124297, translation), in view of Hamamoto et al. (US 2002/0122988)/(US 6,866,966) or Hamamoto et al. (6,927,001), and further in view of Koshina (JP 2003-142075, abstract). Applicant continues to traverse this rejection for the reasons advanced in the Response filed November 1, 2010, those arguments being incorporated herein by reference.

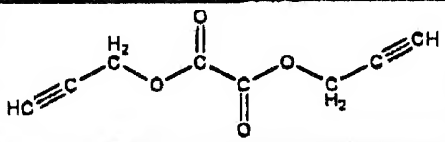
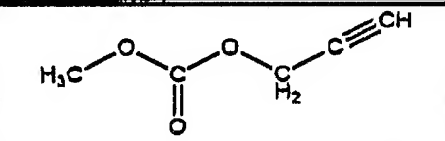
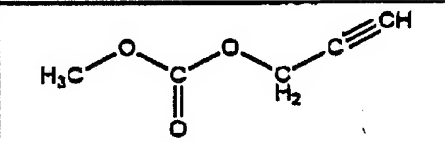
Specifically, as previously noted, the Examiner understands that Hamamoto '297 teaches the use of an alkyne compound corresponding to Applicant's recited alkyne compound (VI) in an electrolyte solution and the use of vinylene carbonate (VC). Further, the Examiner correctly understands that Hamamoto et al. '297 does not teach the amount of vinylene carbonate present. As for the amount of vinylene carbonate in an electrolyte solution, the Examiner relies on Hamamoto '988 or Hamamoto et al. '001.

Hamamoto '988 appears to teach the use of vinylene carbonate in an amount of 2 wt.%. However, Applicant continues to contend that Hamamoto '988 merely teaches a

combination of 2 wt.% of vinylene carbonate and methyl 2-propynyl carbonate and does not teach the combination of 2 wt.% of vinylene carbonate and the oxalyl group-containing alkyne compound belonging to Applicant's recited alkyne compound of formula (VI). The Examiner does note a formula of the methyl 2-propynyl carbonate. It is clear, however, that the 2-propynyl carbonate of Hamamoto '988 is not the oxalyl group-containing alkyne compound of the currently recited invention.

With regard to Hamamoto '001, this patent appears to teach the use of vinylene carbonate in an amount of 1.5 wt.%. However, Hamamoto '001 merely teaches a combination of 1.5 wt.% of vinylene carbonate and methyl propargyl carbonate (which is the same as the above-mentioned methyl 2-propynyl carbonate) and does not teach the combination of 1.5 wt.% of vinylene carbonate and the oxalyl group-containing alkyne compound belonging to Applicant's recited alkyne compound of formula (VI).

In order to assist the Examiner in recognizing the difference between the methyl 2-propynyl carbonate (or methyl propargyl carbonate) and the recited oxalyl group-containing alkyne compound, particularly, di(2-propynyl)oxalate, Applicant again illustrates below the chemical formulas of these compounds.

di(2-propynyl)oxalate	
methyl 2-propynyl-carbonate	
methyl propargyl carbonate	

The invention of Hamamoto '297 is directed simply to the use of the alkyne compound (VI) in a non-aqueous electrolytic solution for lithium secondary batteries. Although Hamamoto '297 describes possible use of vinylene carbonate as one component of the non-aqueous solvent, there is given no teaching to the effect that the use of vinylene carbonate in combination with the alkyne compound (VI) brings about certain favorable effects in comparison with the use of the alkyne compound (VI) in combination with other non-aqueous solvents. No working examples are presented for the use of the combination of the alkyne compound (VI) and vinylene carbonate. The discharge capacity retentions of lithium secondary batteries are evaluated in the form of a coin battery in relatively mild conditions such as the 50 cycle charge-discharge procedures at room temperature (20°C) and at 0.8 mA.

In contrast, in Applicant's claimed invention, a lithium secondary battery claimed in the instant application has been made based on the inventors' finding that the lithium secondary battery employing a non-aqueous electrolytic solution containing the combination of a small amount of a vinylene carbonate of formula (I) and a small amount of an alkyne compound of formula (VI) shows a prominently improved discharge capacity retention (i.e., remaining rate of discharging capacity) after repeated charge-discharge procedures such as 300 cycle charge-discharge procedures at such a high temperature as 60°C and at such a high charge-discharge current as 2.2A (1C) when the above-mentioned electrolytic solution is employed in a cylindrical battery in combination with the combination of the positive electrode and negative electrode both having the defined high density.

The above-mentioned finding is experimentally shown in the specification. Specifically, Example 13 describes a lithium secondary battery employing an electrolytic solution containing a combination of 0.2 wt.% of di(2-propynyl) oxalate and 3 wt.% of

vinylene carbonate (see Example 1) which shows such a high discharge capacity retention after 300 cycles as 81.7%. The Examiner is requested to compare this high discharge capacity retention with the discharge capacity retention of 64.3% which is seen in the lithium secondary battery of Comparison Example 1 (containing 3 wt.% of vinylene carbonate and no alkyne compound) in Table 1, as well as provided in the results of additional experiments provided in the Declaration Pursuant to Rule 132 filed November 1, 2010.

Although the Examiner further attempts to address these points on pages 4-6 of the Office Action, Applicant does not agree with the Examiner's conclusions for the same reasons presented on November 1, 2010.

In view of the foregoing, it is respectfully requested that claim 13-19 be allowed and that the application be passed to issue. If the Examiner believes a conference would be helpful to facilitate allowance of the instant application, he is invited to telephone the undersigned to arrange such a conference.

Respectfully submitted,

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